TECHNICAL REVIEW DOCUMENT
for
RENEWAL
of
OPERATING PERMIT 95OPOT071

to be issued to:

La Junta Municipal Utilities
La Junta Power Plant
Otero County
Source ID 0890003

Michael E. Jensen
October 10, 2001

I. Purpose:

This document will establish the basis for decisions made regarding the applicable requirements, emissions factors, monitoring plan and compliance status of emission units covered by the renewed operating permit proposed for this site. The original Operating Permit was issued August 1, 1997, and expires on August 1, 2002. This document is designed for reference during the review of the proposed permit by the EPA, the public, and other interested parties. The conclusions made in this report are based on information provided in the renewal application submitted June 7, 2001; previous inspection reports, as well as telecommunications with the applicant. Please note that copies of the Technical Review Document for the original permit and any Technical Review Documents associated with subsequent modifications of the original Operating Permit may be found in the Division files as well as on the Division website at http://www.cdphe.state.co.us/ap/Titlev.html.

II. Source Description:

This facility generates electricity for primary, emergency, and peaking use and is classified under the Standard Industrial Classification code 4911. The facility consists of nine (9) internal combustion engines driving electrical generators. Five of the engines are run on diesel fuel while the other four engines are capable of running on diesel, or a mixture of diesel fuel and natural gas. Two of the engines are designated as inoperable and used for spare parts. The facility has an approximate electrical generation capacity of 18 mega-watts (MW).

The engines had the following installation dates:

S001 – 1939	S004 – 1942	S007 – 1962
S002 – 1939	S005 – 1950	S008 – 1962
S003 – 1939	S006 – 1958	S009 – 1971

Engines S001 and S005 are inoperable and used for spare parts only. Engines S002, S003 and S004 are diesel fired while engines S006, S007, S008 and S009 may use either diesel fuel or a mixture of diesel fuel and natural gas.

III. Applicable Requirements

The facility is located in the city of La Junta, Otero County, Colorado. It is bounded by First Avenue, Bellview Avenue, and Highway 50. The area in which the plant operates is designated as attainment for all criteria pollutants. There are no affected states within 50 miles or Federal Class I designated areas within 100 kilometers of the plant.

The facility is not subject to the requirements of Section 112(r)(7), the Accidental Release Plan Program of the Clean Air Act. This facility, at approximately 18 MW, is exempt under 40 CFR 70.6 (b)(2) from the Title V (Acid Rain) program. There are no pollutant-specific emission units at the facility that use a control device to achieve compliance with any emission standard or limitation. Therefore, the Compliance Assurance Monitoring (CAM) rule provisions do not apply.

Colorado Construction Permits were not required prior to 1972. Because the various units are considered "grandfathered" from existing Construction Permit requirements (Colorado Regulation No. 3, Part B, Section I.A.), there are few applicable requirements. The units have no limits for most pollutants. However, the actual emissions must be calculated for fee and inventory purposes.

Information on the design heat rates for the dual fuel engines is no longer available. La Junta submitted information that a 10% diesel fuel/90% natural gas fuel mixture represented the approximate actual design for the dual fuel engines. While the Division does not necessarily accept there is anything to preclude La Junta from using a higher percentage of natural gas in the fuel mixture, the Division accepts the calculation of the Potential To Emit based on the 10/90 fuel mixture in the absence of credible evidence to indicate otherwise. The Potential To Emit values shown elsewhere in this document are based on the dual fuel engines running 8760 hours on diesel fuel only, or 8760 hours operating on dual fuel (10% diesel fuel and 90% natural gas).

This source is considered to be a major source for nitrogen oxides (NOx), sulfur dioxides (SO_2) and carbon monoxide (CO) in an attainment area (Potential to Emit > 250 Tons Per Year) but was constructed prior to the creation of the Prevention of Significant Deterioration (PSD) regulations on December 5, 1974, and the adoption of the current regulation on August 7, 1980.

In general, equipment (including internal combustion engines burning fossil fuel containing sulfur) are subject to the Colorado Regulation No. 1 and No. 6 standards for SO_2. However, total facility emissions are below three (3) tons per day and the Division is not aware of any violations of Federal or State Ambient Air Quality Standards. Therefore, the facility is exempt from Regulation No. 1 SO_2 process based standards (Regulation No. 1, Section VI.A.2.). Additionally, all subject equipment was installed prior to the applicability date (January 30, 1979) for the Regulation No. 6
SO_2 standard. Therefore, no specific SO_2 limitations were included in the renewed Operating Permit.

IV. Emission Factors

From time to time published emission factors are changed based on new or improved data. A logical concern is what happens if the use of the new emission factor in a calculation results in a source being out of compliance with a permit limit. For this Operating Permit, the emission factors or emission factor equations included in the permit are considered to be fixed until changed by a modification of the permit. Obviously, factors dependent on the fuel sulfur content or heat content cannot be fixed and will vary with the test results. The formula for determining the emission factors is, however, fixed. It is the responsibility of the permittee to be aware of changes in the factors, and to notify the Division in writing of impacts on the permit requirements when there is a change in factors. Upon notification, the Division will work with the permittee to address the situation.

Regulation No. 3, Part A, Section II.B1. establishes a ranking for methods for estimating emissions. The use of emission factors from actual test data is required where the information is available. Emission factors published in the EPA Document AP-42, Compilation of Air Pollutant Emission Factors are the next choice, followed by emission factors published in other sources acceptable to the Division, mass balance calculations and other engineering calculations. A permittee may elect to use emission factors greater than AP-42 in order to provide a conservative emissions estimate or in the belief that a higher factor is more representative of the performance of the source. The Division generally accepts the request to use emission factors greater than AP-42 without the need for validation. The use of emission factors lower than AP-42 must be validated by a source performance test.

Several of the published AP-42 emission factors have changed since the previous Operating Permit was issued. La Junta utilized a conservative approach in selection of the emission factors. The highest AP-42 factor or an existing emission factor greater than AP-42 was selected. La Junta selected the emission factors for a 4-stroke lean burn natural gas fired engine to represent the emissions from the natural gas combustion in the dual fuel engines. Testing of similar engines with a portable flue gas meter identified exhaust oxygen concentrations more typical of a lean burn engine than a rich burn engine. It should be noted that La Junta requested to express the diesel fuel emission factors in pound per gallon, instead of the more conventional pounds per thousand gallons.

La Junta requested to use a fixed value for the sulfur dioxide emission factor. The value would be set by using the worst case value for the fuel sulfur content in the sulfur dioxide emission factor equation where 0.1438S equals the pounds of sulfur dioxide emissions per gallon of diesel fuel combusted. The monitoring requirements discussed later include a fuel monitoring program to demonstrate the fuel sulfur content is less than the assumed worst case value.

The use of diesel and natural gas together creates what is known as a dual-fuel engine. These engines were developed to obtain performance benefits inherent to both fuels. EPA AP-42, Section 3.4 Large Stationary Diesel and All Stationary Dual-fueled Engines, contains specifics on these engines. While AP-42 does have

emission factors developed for dual-fuel engines operating with a fuel mixture of 95% natural gas and 5% diesel fuel, the La Junta engines operate with a 90% natural gas and 10% diesel fuel mixture. La Junta does not believe the application of the AP-42 dual-fuel emission factors would be a correct representation of the emissions from their fuel mixture. La Junta requested the dual-fuel combustion emissions be represented as the sum of the emissions from the respective fuel components. Therefore, the respective emission factors for diesel and natural gas are used in combination with the amount of each fuel consumed. The resultant estimated emissions for each fuel type are then summed to estimate the emissions from the dual-fuel engines.

In the following table the white print with black background displays the emission factors selected for the renewed permit.

Natural Gas Fired IC Engines
AP-42 July 2000 Version Table 3.2-3 4-stroke Lean-Burn Natural Gas Fired IC Engines
NG heat content = 1020 Btu/scf

	AP-42		Previous Title V
Pollutant	Lb/MMBtu	Lb/MMscf	Lb/MMscf
NOx	4.08	4161.6	3400
CO	0.557	568.14	430
SO2	0.00059	0.60	0.6
VOC	0.118	120.36	82.9
PM	0.00999	10.19	10
PM10	0.00999	10.19	10

Diesel Fired IC EnginesAP-42 October 1996 Version Table 3.4-1 "Emission Factors for Large Stationary Diesel Engines"
Diesel fuel heat content 139,000 Btu/gal

	AP-42		Previous Title V
Pollutant	Lb/MMBtu	Lb/gallon	Lb/gallon
NOx	3.2	0.456	0.469
CO	0.85	0.121	0.102
SO2	1.01S	0.1438S (0.072)	0.0312
VOC	0.09	0.013	0.0321
PM	0.1	0.014	0.0335
PM10	0.1	0.014	0.032

Unit #	Maximum Annual Consumption (8,760 hours)			Heat Rate (MMBtu/hr)	
	Operating on Diesel Fuel Only	Operating on Dual Fuel			
	Diesel (Gallons)	Diesel (Gallons)	Nat Gas (SCF)	Diesel	Dual Fuel
2	490,560	N/A	N/A	7.78	N/A

3	262,800	N/A	N/A	4.17	N/A
4	560,640	N/A	N/A	8.90	N/A
6	1,138,800	122,640	183,960,000	18.07	22.95
7	2,093,640	324,120	332,880,000	33.22	43.14
8	2,093,640	324,120	332,880,000	33.22	43.14
9	2,575,440	262,800	280,320,000	40.87	36.17
Totals	9,215,520	1,033,680	1,130,040,000	N/A	N/A
Diesel Fuel Heat Rate calculated as follows: (maximum annual diesel fuel consumption / 8760) X 0.139 MMBtu/gal					
Dual Fuel Heat Rate calculated as follows: ((maximum annual diesel fuel consumption on dual-fuel/8760) x 0.139 MMBtu/gal) + ((maximum annual natural gas fuel consumption / 8760) / 1000 Btu/scf)					

	POTENTIAL TO EMIT, Tons Per Year					
Source	**PM**	**PM_{10}**	**SO_2**	**NO_x**	**VOC**	**CO**
S002 – Fairbanks Morse, Model 33D16, SN 813749, 1225 HP						
Diesel	8.22	7.85	17.66	115.04	7.87	29.68
S003 – Fairbanks Morse, Model 33D16, SN 814908, 700 HP						
Diesel	4.40	4.21	9.46	61.63	4.22	15.90
S004 – Fairbanks Morse, Model 33E16, SN 821690, 1750 HP						
Diesel	9.39	8.97	20.18	131.47	9.00	33.92
S006 – Worthington Model SW-14-VEE, SN V03479, 3631 HP						
Dual Fuel	2.99	2.90	4.47	411.54	13.04	59.68
Diesel	19.08	18.22	41.00	267.05	18.28	68.90
S007 – Cooper/Bessemer Model LSV16, SN 6493, 4945 HP						
Dual Fuel	7.13	6.88	11.77	768.66	25.24	114.17
Diesel	35.07	33.50	75.37	490.96	33.60	126.67
S008 – Cooper/Bessemer Model LSV16, SN 6494, 4945 HP						
Dual Fuel	7.13	6.88	11.77	768.66	25.24	114.17
Diesel	35.07	33.50	75.37	490.96	33.60	126.67
S009 – Enterprise Model DGSRV-16-4, SN 70038-2288, 7131 HP						
Dual Fuel	5.83	5.63	9.55	644.92	21.09	95.53
Diesel	43.14	41.21	92.72	603.94	41.34	155.81
TOTALS	154.36	147.45	331.76	2,901.92	147.91	557.54

	POTENTIAL TO EMIT, Tons Per Year					
Source	**PM**	**PM_{10}**	**SO_2**	**NO_x**	**VOC**	**CO**
Actual Emissions Data Year 2000						
	1.65	1.65	0.48	27.97	0.99	3.48

Shaded values in table were **NOT** used to calculate total PTE

V. Monitoring

The Technical Review Document for the existing Title V permit noted the Division had determined, based upon AP-42 emission factors and engineering judgement, that visible emissions from internal combustion engines when solely burning diesel fuel and a diesel/natural gas mixture will be minimal. Additionally, the units are used sparingly. For the 20% opacity limit an observation was required every 6 months with 24 hours of startup and then again during normal operation. For the 30% opacity limit an observation was required once per year within one hour of commencement of startup.

La Junta's experience with the permit requirements found that a startup for an engine is normally complete within 5-10 minutes. Therefore, opacity observations within one hour of startup, within 24 hours of startup and normal operation all address the same operating conditions. In addition, La Junta drains the radiators of the engines in the winter, and will only refill the radiators and start the engines in an emergency. This action further restricts the general operating window for the engines. The Operating Permit renewal application stated La Junta believed situations existed where it would be necessary to operate the engines solely for the purpose of performing an opacity observations. La Junta proposed changes to the observation frequency based on their experience.

The Division reviewed the existing permit requirements and notes that opacity observation requirements for one hour of startup, within 24 hours of startup and during normal operation all end with "(if applicable)". The monitoring section of the existing Technical Review Document states "Observations are not required for units which are not run during the year." The Division believes the existing permit adequately addressed the need not to operate an engine just to perform and opacity observation. The permit wording has been modified to clearly state that it is not necessary to run the engine for the sole purpose of obtaining an opacity observation.

A Method 9 observation requires opacity observations for 6 minutes. La Junta reports that startups generally require 5-10 minutes. The Division believes that startups lasting longer than 10 minutes indicates a problem with the engine performance which will likely be reflected in the opacity of the emissions which would warrant an opacity observation.

The Division reviewed the generally limited operating time of the engines and the monitoring frequency for opacity observations. The monitoring frequency was revised to require one opacity observation for each calendar quarter when the operating time under load for an engine. The Division believes the modified

requirement allows La Junta to adequately anticipate when an opacity observation may need to be done, does not require un-needed observations, and provides a frequency appropriate to the level of operation.

A diesel fuel monitoring program is necessary to demonstrate the fuel sulfur content remains less that an assumed worst case value as discussed under the previous section on emission factors. ARPA requested vendor supplied information be used for the fuel monitoring. The Operating Permit requires ARPA to obtain certified documentation from the vendor that the diesel fuel complies with the ASTM specifications for the grade of diesel fuel purchased, and specifically complies the fuel sulfur content complies with the specification standard.

VI. Compliance

The renewal application and recent inspection reports identify the facility to be in compliance with all the applicable requirements.

VII. Miscellaneous

The Title V permit has been modified to reflect the standardized format now currently in use by the Division, and wording approved by EPA.